A VISIT

TO THE

ARNOLD ARBORETUM

By W. J. BEAN

of the

ROYAL GARDENS, KEW, LONDON

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TO VISIT THE

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For many years past the most generous contributor of hardy trees and shrubs to Kew has been Professor C. S. Sargent, Director of the Arnold Arboretum, near Boston, U. S. A. It has long been known to us that in the establishment he controls there exists the richest collection in the world of the hardier North-east American and North Asiatic woody plants, and, with a view to ascertaining what was lacking in, and might be obtained for, the Kew collection, I was deputed by the Director to pay a visit to this establishment, and afterwards to see as much of the horticulture — especially the tree and shrub growth — of the surrounding country as was possible in the twenty days I remained there. I landed in Boston on June 16th, and sailed for home from NewYork on July 6th last. About half my time was spent in the Arnold Arboretum, and I also visited the public gardens of Boston, New York and Rochester, the Victoria Park on the Canadian side of Niagara, as well as some private gardens of repute in the neighbourhood of Boston and New York.

History and Origin.

The Arnold Arboretum extends over some 220 acres and is situated in Jamaica Plain, one of the suburbs of Boston, easily reached from any part of the city by electric tramcars. It owes its name and origin to Mr. James Arnold, a wealthy merchant of New Bedford and a member of a well-known Quaker family, who, about the year 1870, left 100,000

dollars "for the promotion of agricultural or horticultural improvement." One of the trustees of this fund was Mr. George B. Emerson, the author of the well-known work on the "Trees and Shrubs of Massachusetts," and largely through his efforts and influence, Harvard University was induced to devote 125 acres of some lands belonging to it, known as "Bussey Farm," to the purpose of forming an arboretum. Ultimately the fund grew to 150,000 dollars and a chair of arboriculture with Professor Sargent as its first occupant was instituted in 1873. The area has since been added to by some 90 acres.

The income from 150,000 dollars was a small sum with which to make and carry on an arboretum of the dimensions contemplated, yet with this Professor Sargent was expected to develop over 120 acres into a scientific garden and without (as he observes) a library, or collection of plants, public interest or support to begin with. Difficult as the task was, it has been accomplished, and the Arnold Arboretum is to-day a remarkable monument to the hard work, perseverance, diplomacy and skill of one man. Since its foundation Professor Sargent has raised some 1,200,000 dollars to develop and maintain the institution, and his aim is to secure an endowment fund of at least 1,000,000 dollars to carry it on in permanence. Considering the work the Arboretum has done and is doing, that sum seems a very modest one and, in a country so rich as the United States in public-spirited men, will no doubt be obtained. Besides an incalculable amount of work, Professor Sargent himself has given his books, illustrations and herbarium to the Arboretum — a princely gift, for it forms the bulk of a library now consisting of 23,000 volumes, all of which deal in greater or less degree with the woody vegetation of the globe.

The aim of the establishment is to provide facilities for the study of the trees and shrubs of the whole world, but especially those of North America. A handsome building, known as the Museum, was built in 1892, at the cost of the late Mr. H. H. Hunnewell of Wellesley; and recently an extension of it has been erected at a cost of £8,000. The older part is now used to hold the library, and to provide offices for the members of the staff. The newer portion houses the herbarium and consists of four stories fitted with air-tight steel cabinets sufficient to hold 1,000,000 sheets. These steel cases reach from the floor to the ceiling so that there can be no accumulation of dust above them, and they are a great improvement on the common wooden ones of the older herbaria, as they are fireproof, economise space and do not warp or admit dust. They are, of course, much more costly. On the ground floor of the Museum there is a fine collection of specimens of North American timbers, which are part of the famous Jesup collection, the main portion

of which is now exhibited in the Natural History Museum at New York. In an adjoining room there is an excellent collection of the fruits of Coniferæ. Many of these, especially the cones of firs, spruces and pines are too large and bulky to be accommodated on the shelves of ordinary cabinets and are here arranged in drawers.

The herbarium is under the immediate charge of Mr. C. E. Faxon, Professor Sargent's co-worker and the most famous of American botanical artists. He made the illustrations for the great *Silva of North America*, for the *Manual of the Trees of North America*, and was the regular artist for *Garden and Forest* as he is now for *Trees and Shrubs*.

Beauty of Landscape.

To one who enters the Arboretum for the first time the most striking impression received is that of its great beauty of landscape. Only a very small proportion of its area is level, and at several points it swells into bold prominences such as Peter's Hill, Bussey Hill and Hemlock Hill. The last-named is, indeed, the most remarkable part of the grounds. It is a steep hill with outcropping rock and almost precipitous on one side, covered with a primeval growth of "Hemlock" — the American name for *Tsuga canadensis*. Some of the older trees are splendid examples. I measured one over 9 feet in girth of trunk. It is a peculiarly fortunate circumstance that this wood should have been preserved to a public body in whose hands its continued existence is assured, for but little of the primeval forest of the New England States remains untouched, and the fact that this tract is almost within the confines of a large city makes it doubly precious. At its northern base a brook finds its exit from the grounds after having traversed them in various phases and makes a charming feature; especially where it has passed through a flowery meadow, the gully it has worn out fringed with native vegetation, amongst which, at the time I saw it, the elderberry (*Sambucus canadensis*) made a pretty display.

To the top of the sister prominence, Bussey Hill, a carriage drive has been made, and from this point a great expanse of beautiful country can be seen, especially the rolling outlines of the Blue Hills in the far distance.

Another beautiful feature of the Arboretum, and one which makes a special appeal to the foreigner, is the native undergrowth. In place of the lawns and grass which cover so much of the ground in English gardens and parks, there is here a very interesting ground-covering consisting of native plants, amongst which are various species of Vac-

cinium, Aster, Rubus, golden rod and Asclepias, *Baptisia tinctoria*, sweet fern and the poison ivy. Very abundant in places — for it has thoroughly naturalised itself — is the European dyer's greenweed (*Genista tinctoria*) making a gay display in early July. Springing up freely every year amongst this low growth is a crop of seedling oaks and hickories so numerous that, in view of the needs of the exotic trees, they have to be mainly treated as weeds. Professor Sargent finds that this low ground-cover is not only more beautiful and interesting than meadow, but it is also much more favourable to tree growth. It keeps the earth shaded and cooler than a covering of turf, and does not rob the ground of moisture so much. With the crowds that visit Kew a general treatment of the ground in this way would be impossible, but we have found that for trees rare and difficult to grow, a ground-cover of heath is very advantageous, providing shade and shelter for the roots and stem without unduly robbing the soil.

In the more secluded hollows and glades Professor Sargent is developing a rich growth of ferns and shade-loving plants.

Another feature in the landscape of the Arnold Arboretum is the artistic treatment of the walks and boundary walls. Unlike Kew, the grounds are open to horse-drawn carriages (not motors) and are traversed by a system of broad, finely planned roads, which were made and are maintained by the Park Department of the city of Boston. (It may here be mentioned that in maintaining these roads, in providing police protection, and in holding the property forever free of taxes, Boston does something towards the support of the most beautiful of its open spaces.) On each side of the road and separated from it by a few feet there is a path for foot traffic. A triple track of this kind is not, of course, in itself an object of beauty, but by planting the space between the carriage drive and the footpath with a varied shrubby growth which provides usually a low irregular fringe to the footpaths, but sometimes is high enough to seclude them entirely, Professor Sargent has given them a singular charm. Through the wilder parts of the grounds grassy ways have been made which are kept closely mown to the width of a single cut of a mowing machine. Winding through the tree collections or across the hill slopes they provide the pleasantest of walking tracks.

The Arboretum is surrounded by a low wall of stone which makes an effective boundary, but is not at present high enough to exclude trespassers — as it is hoped eventually to make it. This wall is covered with a variety of climbing plants, amongst which the species of Clematis, Vitis and Celastrus are most conspicuous. These plants, which are

pruned back annually in spring, had, by the time of my visit, about hidden the walls in a beautiful tangle.

The Collections.

It would, of course, be impossible to give any detailed mention of the collections of trees and shrubs. In a general way they are extremely rich in north-east American and north Asiatic species, but comparatively weak in European and west North American, whilst the floras of New Zealand and South America are scarcely, if at all, represented.

To one who has never been out of Europe before the perfect development of the native American trees naturally appeals most strongly. Especially does one admire the splendid full-grown hickories, only known as comparatively small trees in this country; the various white oaks which do not thrive at all with us, and especially the beautiful plumose branching and shapely form of the sugar maple, rarely or never seen in perfection here.

The climate of Boston, judging by its vegetation, bears about the same relation to the British Isles as that of Central Europe. The summers are much brighter and hotter; the winters much colder. In consequence, deciduous trees and shrubs flower with much greater certainty and freedom than they do in Britain, they bear fruit more plentifully, and the colouring of the decaying foliage in autumn is richer than anything ever even suggested in our climate. The climatic conditions of Boston are evidently very favourable to the growth as well as the flowering of many north Asiatic trees and shrubs. The oaks, for instance, introduced by Professor Sargent from Japan 20 years ago, such as *Q. crispula*, *Q. glandulifera*, and *Q. grosseserrata* have made splendid progress and are proving admirable trees. *Cercidiphyllum japonicum* which at Kew, owing to its young growth being cut back by frost once or twice every spring, has never got beyond the dimensions of a scrubby bush, is in the Arnold Arboretum represented by several vigorous cleanly-grown trees 30 to 40 feet high. The bush honeysuckles (*Lonicera*) have a value as ornamental fruiting shrubs beyond anything we ever experience. By the latter part of my stay in Boston many of them had become covered with crops of fruit beautiful in their abundance and in the translucence of their red, yellow or other colouring.

Perhaps the most noticeable difference between the general aspect of the vegetation of the Arnold Arboretum and that of English gardens

is the absence of our common evergreens. Neither the holly, the yew, the ivy, the aucuba, nor the box appears to be genuinely hardy, and only a small proportion of our garden varieties of Rhododendron succeed well. The Chilian *Berberis Darwinii*, the New Zealand veronicas, the bay laurel, *Magnolia grandiflora*, the arbutuses are all too tender to be grown in the open. In the matter of evergreens as a whole English gardens have much the advantage.

Kalmia latifolia.

On the other hand such conifers and flowering evergreens as are hardy thrive exceedingly well. One of the great annual displays of the Arnold Arboretum is made by *Kalmia latifolia*. When I landed in Boston on June 16th, this shrub was in its full beauty both here and in the grounds of Professor Sargent's residence at Holm Lea. In the Arnold Arboretum it covers a sloping bank at the northern base of Hemlock Hill, forming an irregularly disposed mass perhaps 200 yards in length and 10 to 20 yards wide. There is considerable variety in the size and depth of shade of the blossom, and in the density of the flowers in the truss. With the dark masses of hemlock in the background the whole made a picture of exceeding beauty. No European visitor in the neighbourhood of Boston in mid-June should miss the sight of this splendid bank of Kalmia. Its beauty both in Professor Sargent's garden and in the Arnold Arboretum would seem to show that this shrub, although long introduced and well known, has either been neglected in Britain or that our climate generally is not so well adapted for it as it is for most evergreens. It would appear, however, that the former is the case as there are some very fine specimens in the south of England.

The botanical collection of shrubby plants is arranged in a series of long parallel borders, each border being about 8 or 10 feet wide and separated from the next by a grass walk. The shrubs are brought together in their respective genera and natural orders and there is only a single row of plants down the centre of the border. This allows each plant to stand on its own ground without interference from its neighbour, and the convenience of the student is further aided by each specimen having a label on either side. The general idea is somewhat similar to that of the arrangement of the herbaceous plants at Kew. Considered as part of the landscape this system is not beautiful, especially in the early stages, when the plants are not fully grown and bare spaces yet await their destined occupants. But for purposes of botanical study no other arrangement is so convenient.

The collections of trees are, of course, spread over the Arboretum generally, the earlier natural orders (in the Bentham and Hooker sense) being planted at the eastern portion of the grounds near the Museum. A special consideration is paid to American trees that reach timber-producing size. With these the system is to plant (first) a number of specimens in a group close enough to develop trunks instead of side branches and thus show their timber value; and (second) a single specimen at a distance of not less than 100 feet from its companion group. This is to show its value as an isolated tree for gardens, parks, &c.

American Thorns.

One of Professor Sargent's great tasks for some years past has been the elucidation of the North American Crataegi. It has involved an enormous labour but during the course of it he and his co-workers have been able to introduce to cultivation many new, very distinct and beautiful species. A number of dwarf bushy species are of particular interest to planters because their low, almost shrubby habit makes them suitable for places where the older thorns, from considerations of space, could not previously be grown. About fifteen acres on the eastern slope of Peter's Hill have been devoted to the type collection of American thorns. The plants have been raised from the type trees of each species and every plant has its place defined on a plan of the site, so that, in case of loss of label, its identity would be recoverable. From ten to twenty years must elapse before this collection reaches its best, but it will eventually constitute probably the most remarkable assemblage of members of a single genus in the world.

It was too late in the season to see the flowering of the rich and well-grown collection of garden varieties of lilac, but *Syringa japonica*, the noblest of the genus and a tree here over 30 feet high, was very striking in the profusion of its large pyramidal panicles of white blossom. Even with us it is a very useful small tree because of its late flowering, but it is one of the instances already alluded to where North Asiatic deciduous trees thrive much better in places where the summers are hotter than ours.

One of the great annual displays of blossom in the Arboretum is made by *Rhododendron Kaempferii*, a Japanese ally of *R. indicum* but very hardy, introduced by Professor Sargent less than 20 years ago. This and most of the other azaleas were past before my visit, but I was fortunate to find *R. arborescens* — an azalea native of the Eastern United States — fully in flower. Its flowers are white with long red stamens,

and its charm is heightened by a most gracious perfume. It is curious that it is scarcely known in British gardens.

Several notable hybrid roses have appeared in the Arboretum raised by Mr. Jackson Dawson. Mr. Dawson has, like Professor Sargent, seen, and helped in, the development of the Arboretum since its inception, and in regard to the outdoor department he has in a great measure played the part of builder to that of the Professor's architect. Trees now 60 feet high, he himself raised from seed, or collected as seedlings in the forests. Gifted with that peculiar understanding of plant life which enables its possessor to divine by intuition the treatment best suited to his charges and the happiest devices for increasing their number, Mr. Dawson has done much by his genius as a propagator towards making the collections so rich as they now are. He was about the first to recognize the value of *Rosa multiflora* and *R. Wichuraiana* for hybridising, and such fine roses as The Dawson, Lady Duncan, William C. Egan and Arnoldiana are the products of his skill.

I was fortunate to see a new rose in flower which Mr. Dawson has raised and called the Sargent Rose. The original plant raised in 1903 is now 8 feet high and 9 feet through, a sturdy bush with splendidly vigorous foliage. It bears large flattish trusses of semi-double flowers 3 inches across, of a delicate, apple-blossom shade, and from 30 to 50 in a truss. In June it was carrying thousands of flowers — a wonderfully beautiful picture. Its parentage is as follows: pollen bearer "Baroness Rothschild"; seed-bearer an unnamed hybrid between *R. Wichuraiana* ♀ and "Crimson Rambler" ♂. In this interesting combination the influence of *R. Wichuraiana* is only seen in the very glossy, thick, dark green foliage.

What the Arboretum has done.

From what has been said it will have been gathered that the Arnold Arboretum is filling a very important part in the advancement of arboriculture in North America and Europe. Being in one respect part of the park system of Boston, it provides a very beautiful place of resort for the people of that city. It provides also many lessons in landscape art, for there is evidence that every aspect of the grounds has been the subject of careful study in that respect. While the scientific side of the establishment necessarily dominates all others, the natural beauties of the site have not only been preserved but greatly enhanced.

Considered from the practical side, as apart from pure botany,

perhaps the most notable work it has done has been the popularisation and dissemination of American trees and shrubs. Before its foundation, American gardens appear to have mainly depended for their ornamentation on plants of European origin. As an instance, I was told that 30 to 40 years ago one could not have purchased one hundred American oaks in American nurseries. The flora of the east United States has given an extraordinary number of beautiful trees and shrubs to English gardens, and in the latter half of the 18th century and the beginning of the 19th their introduction and cultivation was the chief interest of the most ardent horticulturists of the period. Many of the shrubs then introduced disappeared in course of time, and the Arnold Arboretum has done much good work in re-introducing them. Such shrubs as *Vaccinium hirsutum*, *Rhododendron arborescens*, *Gaylussacia brachycera*, *Kalmia cuneata* and *Fothergilla major*, are a sample of the many delightful plants which have in this way been restored to us. Many quite new species have also been introduced to cultivation, whilst others, long known but rare, have been made more plentiful.

Next to the woody vegetation of his own country Professor Sargent has given most attention to that of northern Asia. He himself has enriched American and European gardens with numerous trees and shrubs collected in Japan in the early "nineties." It would need too much space to enumerate half the things introduced through him and the institution he controls. On behalf of the institution in its relationship to Harvard University, two collectors, Messrs. Wilson and Purdom, are now travelling in China, and the former had previously spent two or three years there in the same work.

Whilst my object has been to indicate as briefly as possible what the Arnold Arboretum is and what it does, and to show that it is an institution which Harvard University and the City of Boston in particular, and the United States in general, have every reason to cherish and be proud of, I should not conclude without a few words in appreciation of the remarkable man who has made it, to whom it owes its splendid efficiency, and on whom its continued existence as a scientific institution has largely depended. Among the numerous qualities that are needed to make the perfect Director of a large public garden there are three that stand out as peculiarly essential. As a matter of course he should have great scientific attainments, and in these days he needs also a keen perception of landscape beauty; finally he must possess the business faculty. To few have

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these attributes been given in so full a degree as to Professor Sargent. No one has done a tithe as much for the advancement of knowledge in regard to North American trees and shrubs, and although now in advanced middle age, he still retains an untiring mental and physical energy. A great traveller, he has seen all but a few of the North American trees growing in their natural haunts. He has also introduced many valuable north Asiatic trees to America and thence to Europe. Free from the common craze of the collector for exclusive possession, his desire is that the plants he introduces should become widely diffused in gardens, and the limits of his generosity appear to be set only by the possession of a single plant of a kind.

The literary work of Professor Sargent commenced with the publication of the IXth Volume of the *Tenth Census of the United States* which contained a catalogue of the Forest Trees of North America, amplified by various particulars in regard to habitat, uses, sizes, &c. From 1888 to 1897 he published a weekly journal devoted to forestry and horticulture—*Garden and Forest*—which was probably too much in advance of its period in America to be a financial success, but whose ten volumes are a mine of reliable information, especially in regard to trees and shrubs. In 1894 was published the *Forest Flora of Japan*, the outcome of Professor Sargent's travels in Japan a year or two previously.

His greatest work, however, and the one on which his literary fame will most endure, is the *Silva of North America*, a magnificent work in quarto of 14 volumes, giving one or more portraits, a description, and much historical and other information about every tree of timber-producing size in North America exclusive of Mexico A very successful work is the *Manual of the Trees of North America* to some extent an abridgment of the *Silva*.

At the present time there is being issued at intervals a quarto publication called *Trees and Shrubs* giving illustrations and descriptions of new or little known ligneous plants. Since the publication of the *Silva*, however, the most laborious undertaking under the auspices of Professor Sargent and the Arnold Arboretum is a complete *Bibliography of the Trees and Shrubs of the World* up to 1900, which is now in the hands of the printer. This work will consist of four quarto volumes and will run to 4000 pages. It gives all references to the published literature of any value in all languages dealing with the woody plants of the globe. By its means the student will be furnished with a complete guide to all the authoritative printed information about any known tree or shrub up to the beginning of the present century.